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GAS TECHNICAL SYMPOSIUM IN PARIS, JUNE 1966

by

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The Gas Technical Congress held in Paris from June 14th, 1966, to June 18th, 1966, was attended by R. P. Charbonnier. This important Symposium was organized by the "Association Technique de l'Industrie du Gaz en France", 62 rue de Courcelles, Paris 8, which is the French "learned society" of gas engineers. About twenty delegations from other countries participated in the sessions which were very well organized. Preprints of all papers were available in advance. A complete set of these preprints will be incorporated in the collection of the Mines Branch Library. The papers were not read during the sessions, but the authors had a few minutes to add some new results, indicate any corrections or modifications needed and very briefly summarize their conclusions. Then some discussers, selected from the prepared discussions they had submitted in advance, summarized their comments, which were then answered by the authors. When the time schedule allowed it, the discussion was opened to the audience. Finally the chairman would emphasize the most salient points of the papers. Such an organization permitted the proceedings to be very orderly and efficient. It is by far preferable to the generally boring reading of papers and disorderly discussion without preparation observed at so many technical meetings, although it obviously requires papers to be submitted much earlier.

Altogether twenty-nine papers were included in the proceedings, covering many different aspects of gas technology. Some brief comments on these papers will be as follows:

Paper No.1 - "Appareil de laboratoire pour la comparaison des catalyseurs utilises dans la conversion oxydante des hydrocarbures" (Laboratory apparatus for the comparative evaluation of hydrocarbon oxidizing conversion catalysts) by Jiri Macak, of the Coke and Gas Institute of the Technical University of Chemistry of Prague, Czechoslovakia, 17 pages, 7 figures, 13 tables, bibliography.

The catalysts for the conversion of hydrocarbons with steam are compared according to the quantity of gas produced in a continuous tubular reactor of 17mm diameter made of high alloy (Ni, Cr) steel with isothermal conditions for the catalytic bed. Correct macro-kinetic conditions require the use of samples of a few cubic centimeters. Main features of these catalysts are a 2 to 20 m^2/g specific surface and a 0.3 cm^3/g total pore volume.

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Paper No. 2 - "Polyvalence de certains catalyseurs pour la production de gaz porteur en regime cyclique a partir de gaz naturel et de distillats petroliers legers divers" (Using multi-purpose catalysts for the production of cyclic process carrier gas from natural gas and various light petroleum distillates) by Carmelo FARRUGIA, Centre d'Essais et Recherches No. 1, D.E.T.N., Gaz de France, 20 pp., 15 fig. 10 tables.

The advantage of multi-purpose catalysts is that they make catalyst manipulation unnecessary when using various raw materials. Four catalysts of varying carrier composition (alumina, silica-alumina, magnesia) or nickel content (from 3 to 9%) have been studied for potential use at low pressure for natural gas reforming or for the gasification of sulfur-lean or sulfur-rich light petroleum distillates. All four catalysts are suitable for the cyclic production of carrier gas from natural gas or from light petroleum distillates containing 30 mg/kg sulfur at space velocities from 0.3 to 0.5 kg hydrocarbons/hr per kg of catalyst. Two of these catalysts are also suitable for the complete gasification of sulfur-rich light petroleum distillates (1500 mg S/kg) with relatively high heavy end concentrations, but the gas must then be treated to eliminate impurities. Both other catalysts are particularly sensitive to sulfur poisoning.

Paper No. 3 - "Etude des catalyseurs utilises pour le reformage cyclique des hydrocarbures" (A survey of hydrocarbon cyclic reforming catalysts) by Robert Garlet, Claude Paul and Louis Grandet, of the Office National Industrial de l'Azote, 5 pp., 2 fig., 1 table.

Catalysts carried on silica-alumina show a loss of activity due to a combination between nickel oxide and alumina. The addition of a suitable quantity of lime prevents such a combination but it raises the catalyst sensitivity to feed sulphur, because of the stability of lime sulphur compounds. Catalysts whose carrier contains magnesia are less sensitive to sulphur but their activity is low compared to others.

Paper No. 4 - "Reformage continu sous pression du gaz naturel a la Centrale Gaziere d'Alfortville, (Continuous high pressure reforming of natural gas in the Alfortville gas manufacturing station) by Jean Frere and Maurice Amiand, of Gaz de France, 24 pp., 12 fig.

This new plant has a throughput of one million Nm^3/day of a 4500 mth/m^3 interchangeable gas. Continuous catalytic reforming of natural gas is carried out with steam in two ovens in series. With extensive automation, the plant is operated by only two attendants. It is used to feed either the Beynes underground gas storage reservoir, or the Paris gas distribution network.

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Paper No. 5 - "Fabrication de gaz substituable au gaz naturel" (Manufacture of gas to substitute for natural gas) by Andre Roche, Claude Paul and Jacques Sarlabous, of the Office National Industrial de l'Azote, 8 pp., 2 fig.

The discovery of large natural gas fields has led the gas industry to supplying this gas as such for domestic purposes. Then it is important for peak shaving purposes to develop a method of processing light naphtas under pressure to produce a gas that may be completely substituted for natural gas.

The ONIA-GI process is entirely based on the catalytic hydrogenation of naphtas, according to the following reactions:

$$CHy + H_2O \rightarrow CO + (1 + y/2)\, H_2 + \Delta$$

$$CH_y + (2 - y/2)\, H_2 \rightarrow CH_4 + 11 \text{ mth}$$

The first reaction is carried out in a conventional type of reforming plant under pressure. The second reaction is quantitative with specific catalysts and is carried out in several stages due to its exothermic nature. The overall thermal efficiency of the process is about 92%.

Paper No. 6 - "Produits petroliers pour l'industrie gaziere" (Petroleum feedstocks for the gas industry) by Walter L. Lom, of Esso Research Ltd., Abingdon, England, 11 pp., 8 tables.

This paper deals with the characteristics, the availability and the economics of the petroleum feedstocks which can be used for the manufacture of town gas and similar gaseous fuels. It lists the various petroleum fractions and attempts to correlate feedstock, chemistry of gasification so that the value of different feedstocks to the gas industry can be calculated, provided sufficient information on plant investment, operating costs, mode of operation and conversion efficiency is available. The most suitable feedstocks, i.e. naphta and LPG, being essentially by-products, are in relatively short supply in many areas. It is therefore undesirable to propose unnecessary restrictive specifications for these products, which can only reduce availability and tend to raise prices.

Paper No. 7 - "Comportement dans les stockages souterrains du gaz naturel contenant un odorisant ou de l'air" (Behaviour of natural gas containing air or an odorant in underground storage) by Alec Bramley Densham, of the London Research Station of the Gas Council, Jean Isson and Charles Roux, of the D.E.T.N. of Gaz de France, 18 pp., 5 figs, 9 tables.

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Natural gas as stored in water-bearing underground reservoirs may separately or simultaneously contain oxygen aimed at readjusting the interchangeability index as well as tetrahydrothiophene (T.H.T.) used as an odorant. This paper describes laboratory tests on such gases. Gas composition, nature of the surrounding medium and physical conditions in the reservoir are the main parameters in these tests, which were carried out at a pressure of about 40 bars, and at both 30°C and 37°C, in the presence or in the absence of bacteria. Both synthetic and natural gases containing known oxygen and T.H.T. concentrations have been tested in various humid porous media. Results of the T.H.T. tests are compared with those obtained at the new Saint-Illiers underground storage reservoir.

Paper No. 8 - "Les melanges haute pression, leur regulation et leur controle" (High-pressure gas mixture regulation and control) by Guy Evrard and Guy Le Blevenec, of Gaz de France, 24 pp., 22 figs.

This paper describes the equipment used in gas mixing at high pressures, its advantages, drawbacks and performance characteristics. In its second part, it outlines a technique for controlling and regulating gas mixtures and presents results obtained in both the Alfortville and Beynes mixing stations.

Paper No. 9 - "Influence de l'hydrogene sulfure en solution aqueuse dans le comportement a la fatigue des aciers ordinaires ou faiblement allies utilisables pour les canalisations de transport de gaz" (Influence of aqueous solutions of hydrogen sulphide on the fatigue behaviour of carbon steels and low alloy steels for gas distribution networks) by Professor Paul Bastien, Scientific Research Director at the Ecole Centrale des Arts et Manufactures, Samuel Bezin and Maurice Riviere, of the D.E.T.N. of Gaz de France, 23 pp., 13 figs., 4 tables.

When in contact with aqueous solutions of hydrogen sulphide, steel becomes brittle; it loses a substantial fraction of its static deformation capacity or becomes subject to delayed rupture. This phenomenon is due to the fact that the hydrogen resulting from the superficial attack of the steel by the slightly acid solution migrates into the metal. The experimental data on the influence of diluted hydrogen sulphide aqueous solutions or hydrogen itself on the fatigue limit of steel are scarce and inconsistent. This paper gives a comparison between the behaviours of various carbon steels or low alloy steels at various stages of treatment and various levels of mechanical resistance when varying surrounding conditions: air, water and hydrogen sulphide aqueous solution. The influence of water is very noticeable, decreasing considerably the fatigue limit; this action is further enhanced by the presence of dissolved hydrogen sulphide; steel structures with finely dispersed carbides are the least affected. This study may serve as a guide for selecting steels and structure types to be used in pipelines for gases containing humidity and hydrogen sulphide.

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Paper No.10 - "Le franchissement des cours d'eau en souille par les canalisations de transport de gaz". (Ditching methods for crossing water streams with gas pipelines) by Jean Houard and Paul Hucleux, of Gaz de France, 46 pp., 21 figs.

Although the laying of gas pipelines has been extensively studied from both the technical and the economic viewpoints, a special feature of gas pipelines does not seem to have been very well analyzed and that is the crossing of water obstacles. This paper outlines the technical criteria to be used in crossing water streams, it also establishes a set of consistent economic parameters from a comparative study of many crossings carried out over the past ten years in France. Finally it suggests a set of methods to improve the economics of such projects.

This paper is focused on the most frequent method consisting of ditching for crossing water obstacles. Thus it could usefully be followed with a systematic study of other technical solutions as well as of the most suitable field of application for each method.

Paper No. 11 - "Application de la methode du chemin critique a l'ordonnancement d'etudes et de realisations d'equipements gaziers, par M. Armand Luxo - (Scheduling the design and construction of gas projects with the critical path method) by Armand Luxo, Technical Director of Sofregaz, 19 pp., 4 figs., 5 tables, 23 bibl. ref.

This paper first gives a brief outline of the critical path method and some modifications for scheduling both operations of known invariable duration and operations of aleatory durations, in order to reduce the overall costs of a project or to speed up its execution at minimum cost. The method may be generalized by introducing choices in scheduling.

Two applications are described, firstly the scheduling of a river crossing to be completed within specified time limits, secondly the scheduling of a gas pipeline project with some aleatory operations.

Finally the results obtained in various applications are discussed to assess the limitations of the method and the conditions for its efficiency. The case for computer utilization for performing critical path margin and cost calculations is briefly dealt with.

Paper No. 12 - "Quelques problemes poses par l'etude du marche du gaz dans les agglomerations urbaines des pays en voie de developpement" (Some problems associated with the study of gas markets in the urban districts of developing countries) by Philippe Bourgerie, of Gaz de France, and Philippe Bourcier, of Sofregaz, 21 pp., 5 figs., 4 tables.

Industry, especially power plants and cement factories is the largest single potential gas consumer. Commercial users also offer great possibilities, but the domestic market will long remain limited in spite of a definite trend to use more gas for cooking and also for air-conditioning or sometimes for heating. This study is based on data collected mainly in Greece, Irak, Tunisia, India, Venesuela and Brasil.

Paper No. 13 - "Utilisation et consommation d'energie par les collectivites regionales" (Energy utilization and consumption within regional community organizations) by Pierre Douillet, of Gaz de France, 31 pp., 3 figs., 40 tables.

This study of the fuel market in Communities of the Bordeaux area is based on a statistical survey made in 1962. Every day about 80,000 people use 352 institutions, consuming about 141,000 meals/day, i.e. 35 million meals/year. About half of the 1516 consumption centers do not use the same fuel for heating and for other uses. Fifty-five percent use gas and 15 percent electricity. Gas is used in 80% of cooking appliances, 2/3 of kitchen hot water installations, 50% of sanitary and wash-houses facilities, and 25% of room heating appliances.

Among the institutions using mainly gas, 63% are using fuel oil as their other source of energy, and 30% rely on coal.

The average consumption appears to be about 7 thermics/meal. At present half of the fuel consumption is supplied by fuel oil while gas and coal split the rest about evenly, but the share of gas is expected to increase from 24.5% in 1962 to 52% in 1970.

Paper No. 14 - "Role du gas naturel dans l'energie mondiale" (Role of natural gas in the world's energy supply) by Manucher Farman-Farmaian, of the Societe Nationale Iranienne des Petroles, 11 pp., 10 tables.

Although the great advantages of natural gas both as a fuel and as a raw material are widely recognized, huge quantities of associated gas produced along with crude oil are flared by the producers and thus lost forever, in spite of the objections of the producing countries. The Middle East is most affected by this situation and as it also contains very large gas fields, it could easily export huge quantities of natural gas.

Up to 1965, gas produced with crude oil exceeded 375 billion cubic meters, which is equivalent in heat value to 2.3 billion barrels of oil. About 70% of this total has been wasted by burning it as produced. Recovering such an energy resource would benefit not only the Middle East but the world in general.

This paper considers the role of natural gas in comparison with other energy sources, the production and utilization of natural gas in the Middle East, and some possible ways to export natural gas from Iran to Europe and the USSR by pipeline and to the other parts of the world by methane tankers.

Paper No. 15 - "Influence des gaz obtenus a partir de D.P.L. sur le comportement du caoutchouc" (Action of gases produced from light petroleum distillates on the behaviour of rubber) by Odette Angleraud, Louis Koehler and Jean Vinter, of Gaz de France, 19 pp., 11 figs., 7 tables.

The gases studied here were produced by reforming light petroleum distillates catalytically. First, a carrier gas was enriched by introducing a light petroleum distillate fraction, whose influence alone and in the gas mixture was compared by studying the behaviour of rubber test samples in gas distribution networks. The second part of the paper deals with the distribution of direct gases, which are purified prior to distribution. The tests emphasize the importance of such a treatment, which can result in the presence of heavy hydrocarbons (fuel oil) that cause considerable test sample swelling.

Paper No. 16 - "La station de vaporisation de propane de l'exploitation gaz du Puy-en-Velay" (Description of the propane vaporization plant on the Puy-en-Velay gas network) by Paul Herrmann, of the Subdivision Electricite de France-Gaz de France of Puy, and Robert Crenn, of the Compagnie Industrielle de Montage, 24 pp., 14 figs., 8 tables.

In 1960 the conventional 4,200 mth/ m^3 coal gas was replaced by a 6,500 mth/ m^3 air-propane mixture for the Le Puy gas network. Propane from three 100 m^3 spherical tanks was vaporized in three 150 kg/ h hot water circuits. In 1963 a 150 kg/ h electric vaporizer was added. In 1964 a semi-automatic vaporization plant was designed along the following lines as long as propane pressure in tankage exceeds 2.8 bars, natural vaporization is used. Between 2.8 and 2.5 bars, propane is automatically sent to the vaporizers with automatic control of the boilers burners. Below 2.5 bars, propane pumps are started. There are now 2 units of 1.5 t/ h capacity.

Paper No. 17 - "Contribution au deplacement d'un gazometre spherique moyenne pression et a la signalisation de defauts avec telealarme d'une station de compression, de stockage moyenne pression et d'emission" (Moving a spherical medium pressure gasholder, and installation of a remote alarm system for signalling defects in a compression, medium pressure storage and distribution station) by Rene Henry of Electricite de France - Gaz de France, 14 pp., 14 figs.

This paper describes the technical difficulties encountered and the pollutions used in the displacement of a 10.5 meter diameter gasholder of 600 m^3 used under 4.65 bars, weighing 50 tons. Although surface and helicopter transportations were considered, it was decided to cut the tank in 14 parts, remove them, reassemble them and weld them at the new location.

This paper also outlines the automation and operation controls related to a remote signalling and alarm system introduced in the new plant. The advantages of extensometric and photoelastic measurements as well as automation are thus shown.

Paper No.18 - "Progres recents dans les methodes de calcul physique et economique des reseaux de distribution" (Recent advances in calculation methods for the design and economical optimization of gas distribution networks) by Paul Renouard and Catherine Flour, of the D.E.T.N. of Gaz de France, 12 pp., 4 figs.

After a description of the theory for the design and economical optimization of gas networks, this paper gives results obtained regarding calculation time and the size of networks which can be designed using this method. Finally an outline is given of means aimed at facilitating the preparation work required before proceeding with the calculations.

Paper No.19 - "Contribution a l'etude de la structure economique d'un ensemble de distribution du gaz" (Survey report on the economic structure of a gas distribution system) by Rene Gaulion, of Gaz de France, 15 pp., 10 figs.

This paper describes modifications to a method used for the optimum design of a gas network, based on three investment hypothesis. The main parameters are the low pressure network mesh size and the distribution system pressure. Ranges of optimum numbers of pressure reducing stations and their distances are thus calculated.

Paper No. 20 - "Repartition des temperatures des bruleurs de table de travail des appareils de cuisson domestique" (Temperature distribution in domestic cooker hotplate burners) by James Rouet and Annie Plantureux, of Gaz de France, 16 pp., 6 figs., 2 tables.

The two main parameters of temperature distribution were found to be the burner calorific concentration per unit diameter and the ratio of the free height under the heated container to the flame angle. A formula involving both of these parameters makes it possible to estimate temperature distribution approximately. Good temperature distribution has been obtained with recent stabilized flame burners. The limits of satisfactory temperature distributions have been defined with various experimental burners.

Paper No. 21 - "Etude et mise au point des veilleuses pour appareils a gaz" (Developing gas appliance pilot burners) by Arie Van der Linden, Asst. Director of the Gas-Instituit of The Hague, Holland, and Jean-Marie Sallee and James Rouet, of D.E.T.N. of Gas de France, 20 pp., 15 figs.

Within the frame of the European Group for Gas Research the Liaison Committee for "Universal Burners" has required the Gas-Instituit (Holland) laboratories to study the difficulties experienced with pilot burners. This study in cooperation with Gaz de France investigated the most significant parameters: air rate, feed pressure, gas or air-gas mixture sooting value, pilot burner design. Practical design rules are suggested for the various gases available.

Paper No. 22 - "Contribution aux mesures de protection des conduits de fumee traditionnels en vue de l'usage des appareils d'utilisation domestique du gaz" (A contribution to protective measures taken with conventional flues in connection with the use of domestic gas appliances) by Pierre Faudier, Michel Roussel, Pierre Mousset and Bernadette de Soultrait, of D.E.T.N. of Gaz de France, 28 pp., 21 figs.

Following a brief analysis of a flue operation, condensation and humidification concepts are studied. Improvements in protection by tubing and lining are described, and possibilities for further progress are outlined.

Paper No. 23 - "Bruleurs radiants poreux" (Porous radiant burners) by Lionel Leroy, of D.E.T.N. of Gaz de France, 11 pp., 6 figs.

These burners use the technique of surface combustion by injection. Following an outline of the particular aspects of the operation of these burners, a description is given of laboratory tests carried out using three types of such burners presently available commercially. Finally some considerations are offered on the methods of utilisation of these burners and on their domaine of application. Their advantages with natural gas are specially stressed.

Paper No. 24 - "Combustion directe du gaz naturel en veine d'air. Application au chauffage d'air de ventilation de locaux industriels" (Direct combustion of natural gas in air streams. Application to air heating for industrial building ventilation) by Pierre Hostalier and Lionel Leroy, of Gaz de France, 16 pp., 5 figs.

In many factories, the atmosphere must be purified because of the air pollution by products evolved during manufacturing operations. Foul air is usually evacuated outside and replaced by clean air which must be heated in winter. This paper studies new methods of directly burning natural gas in the air stream introduced in plants with air pollution conditions, where the gas combustion products are mixed with the air used for ventilation,

thereby achieving 100 per cent thermal efficiency at all times. The main problems are those of hygiene and safety conditions because of some combustion products. The USA and USSR safety regulations codes are considered and some design principles are given in this paper with the suggestion that these methods of air heating be seriously considered in many industrial plants.

Paper No. 25 - "Application des proprietes electriques des flammes a la realisation d'un bruleur auto-controlé" (Application of the electrical properties of flames to the design of a self controlled burner) by Denis Waroux and Bernard Maisier, of the D.E.T.N. of Gaz de France, 18 pp., 16 figs.

These studies of electrical properties of flames relate in particular not only to electrical conduction between an electrode immersed in the flame and the burner, but also to the electrical conduction between two flames. This latter phenomenon led to the development of an automatically controlled burner based on the principle of electrical conduction between two burners with convergent flames. The stabilising flame surrounds the main flame concentrically and acts as mass electrode, while the main flame constitutes the control electrode. Industrial tests have been satisfactory.

Paper No. 26 - "Conditions d'emploi du gaz dans les operations thermiques industrielles a basse temperature" (Conditions of fuel gas utilisation in industrial heat treatments involving low temperature heating) by Jacques Maysaal, of Gaz de France, 21 pp., 9 figs.

Low temperature heating represents 30 per cent of the French manufacturing industries heat energy consumption. A simple formulation is given for thermal operations costs and for equivalent costs of fuels. Then these theoretical considerations are applied to the determination of gas utilisation in actual cases. New examples of direct gas heating are presented. Gas is especially suitable for low temperature heating (practically under 300°C) with the proper equipment and techniques.

Paper No. 27 - "Exemple d'application de la combustion en defaut d'air dans les lits en vrac pour la production d'atmospheres de rechauffage sans oxydation" (Producing non-oxidising reheating atmospheres through air-deficient combustion in loose refractory beds) by Philippe Delbourg and Claude Bourdil, of the D.E.T.N. of Gaz de France, 20 pp., 20 figs.

The high temperatures used for reheating steel prior to rolling or forging, and even more the atmosphere used for these operations cause the treated steel to oxidize quickly, with the following inconveniences:

fire loss surface defects, de carbonixation, sole deterioration, etc. Direct fired furnaces designed for non oxidising reheating are not adjusted for the small forging industry. Following theoretical considerations on the oxidation of the iron and carbon constituants of steel, with diagrams for the quick solution of non-oxidising reheating problems using either manufactured or natural gas, this paper describes the design of a furnace for reheating steel lumps as follows: in a first chamber (reactor) on the discharge side, incomplete gas combustion is effected. Loose refractory beds are used. The combustion air is preheated by the recovering of the specific heat. In the second chamber, on the charging side, primary combustion products are burned by injecting cold secondary air. Steel is thus reheated to a temperature at which no oxidation can take place. Steel is moved by a pneumatic system. This furnace may operate at 90 kg/h, 120 kg/h or 180 kg/h with 1.5 kg steel lumps, giving 1230, 1130 or 1050°C core temperatures respectively. The steel surface condition obtained is quite satisfactory.

Paper No. 28 - "Application du rayonnement infra-rouge. Contribution a l'etude de l'augmentation de production resultant du prechauffage de la feuille dans la partie humide des machines a papier" (Applications of infra-red heating. Contribution to the study of the production increase resulting from preheating a paper sheet in the humid section of a paper mill) by Jean Louis Poblador, of the Societe Antargaz, 21 pp., 13 figs.

The main objective was to increase production by maximizing dryness at the drier inlet while remaining competitive in comparison with the solution of adding an extra drum in the drill: Following a review of the various effects of preheating by infra-red radiant panels, the installation is described with special attention to the grouping of panels, the ignition and safety devices and the feeding. The determination of the optimum location of the panels is then analysed. Finally a study is given of the influence of various parameters, inducing velocity, dryness, paste composition and weights per surface unit, initial temperature of the sheet. Examples of industrial applications are also outlined.

Paper No. 29 - "Nouvelle application du propane en ceramique: cuisson du gres d'Alsace au sel" (A new application of propane in the ceramics industry: firing of salt-glazing Alsatian sandstone) by Claude Ride, of the Societe pour l'Utilisation Rationnelle des Gaz, 32 pp., 18 figs.

The use of propane is spreading quickly in the ceramics industry because it makes open flame firing possible. For the salt glazing of sandstones, it results in quicker firing cycles, reduced manpower costs and quality improvement.

A description is given of pilot plant tests using a 500 liter kiln fitted with URG-FP type burners. These tests were scaled up to commercial

stage by using a 2 cubic meter kiln fitted with the same burners. Finally these tests led to a new URG-type GS burner design with a new automatic salting device. This furnace can compete with larger ones, thus fully justifying the use of propane.

In addition to the papers abstracted above, the Gas Technical Congress featured a number of lectures, reports and addresses by prominent participants, such as Mr. Jean Couture, General Secretary of Energy, and Mr. Charles Chevrier, Director for Gas and Electricity, at the Department of Industry; Mr. Henri Embs, Manager of the Societe pour le Developpement de l'Industrie du Gas en France; Mr. Andre Papillon; gas production committee chairman; Mr. Jean Claude Achille, general manager of charbonnages de France; Mr. Andre Amsler, Transportation and storage committee chairman; Mr. Marc Perraud, general studies committee chairman; Mr. Paul Albrieux, gas distribution committee chairman; Mr. Jean LeGuellac, President of Gas de France.

The Congress was under the general chairmanship of Mr. Jean Dhuin, President of the A.T.G., who really gave an outstanding performance, as chairman of numerous and long sessions.

Finally a number of technical visits were offered as follows: Catalytic reforming installations of Alfortville, Gas de France, DETN Research Centre of Alfortville, G.d.F.; Plants of the Societe Alutol, Villeneuve - St. Georges; new large coal/gas burning power plant of Electricitie de France at Montereau; plants of Societe Sovirel at Bagneaux/Loing.

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